



National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
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Surfing the net

Part two of the series looks at NASA's Shuttle Web on the Internet. Story on Page 3.



'Tis the Season

Employees in the Office of Public Affairs gather donations for needy families. Story on Page 4.

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Employees to report for work Monday

With the possibility of a second forced government work stoppage in the wings, top JSC managers reminded all employees this week that whatever happens they are expected to report to work Monday morning.

"As you know, the center is operating under a continuing resolution which expires at midnight on Friday, Dec. 15," Acting JSC Director George Abbey wrote Monday in a letter to all employees. "The White House and Congress continue to negotiate on the budget without much visible progress. Despite this, I'm cautiously optimistic our leaders in Washington won't dampen the holiday spirit with a budget impasse, and hope they'll pass another continuing resolution to keep us going into January.

"If another furlough becomes necessary, we'll repeat the steps we took last time to scale back business in a systematic, organized way. Whether or not you are 'exempt,' you still must come to work on Monday, Dec. 18, to begin an orderly shutdown process," he continued.

JSC Human Resources Director Harvey Hartman said "exempt" employees are the only ones who will work during the furlough. These are employees who hold positions critical for the safety of human life, protection of property or are needed to maintain the shuttle and station manifest, and they will be notified by their supervisors.

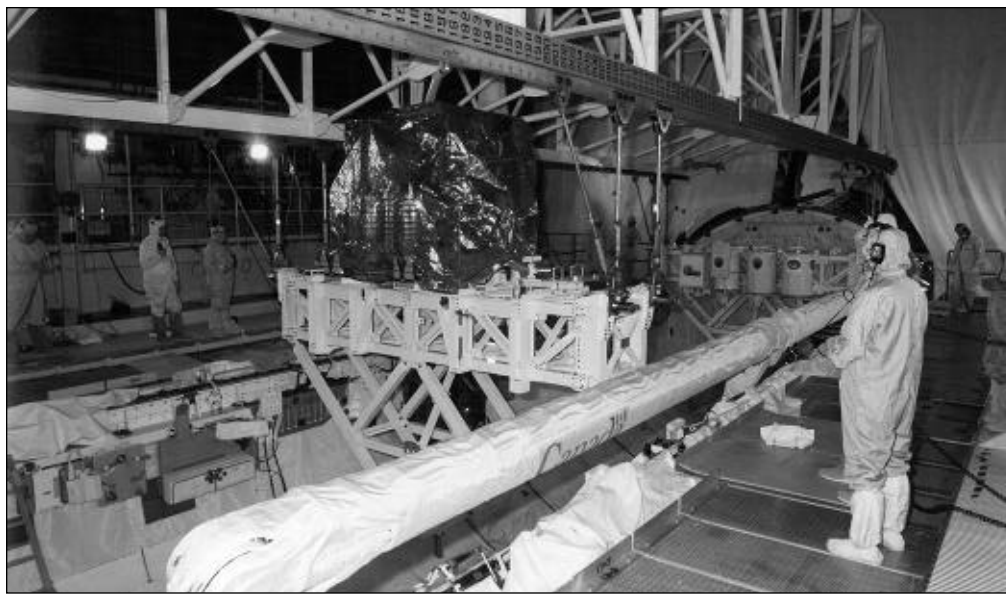
In a letter to all federal employees after the first furlough, President

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JSC Photo by

Above: STS-72 Mission Specialist Koichi Wakata, representing Japan's National Space Development Agency checks over flight plans during a training session in the flight deck of the shuttle simulator while Pilot Brent Jett looks on. Below: Kennedy Space Center engineers look on as the Office of Aeronautics and Space Technology-Flyer, or OAST-Flyer, begins the transfer from the Orbiter Processing Facility into Endeavour's payload bay.



Endeavour crew wraps launch test

By James Hartsfield

Endeavour's preparations for STS-72 continued to proceed smoothly at Kennedy Space Center this week, with the crew and launch controllers completing a dress rehearsal of the launch countdown Wednesday.

The STS-72 crew—Commander Brian Duffy, Pilot Brent Jett and Mission Specialists Leroy Chiao, Winston Scott, Koichi Wakata and Dan Barry—flew to KSC Monday for the launch rehearsal. Earlier, technicians at the launch pad had successfully completed a standard leak check of the orbiter's main propulsion system plumbing.

STS-72, the first shuttle flight of 1996 with launch targeted for 3:18 a.m. Houston time Jan. 11, will feature two rendezvous and two space walks. The primary objectives are the retrieval of the Japanese Space Flyer Unit satellite and the deploy and retrieval of the OAST-FLYER experiment platform.

Late this week, work on *Endeavour* included a flight readiness test of the main engine electrical connections and the early loading of propellants.

Elsewhere, *Columbia* also remains on track for a launch on STS-75, the second flight of the Tethered Satellite System, around Feb. 22. *Columbia's* main engines were installed Monday and Tuesday, and the forward Reaction Control System is being installed today. Wednesday, technicians will secure the spacecraft and close the payload bay doors for the Christmas holidays. *Columbia* is in KSC's Bay 2 processing hangar. The planned third flight of the new year, *Atlantis* on STS-76, the third shuttle-Mir docking mission, also remains on schedule. *Atlantis* is in the Bay 1 shuttle hangar, and work this week included removal of the main engines and the Orbiter Docking System.



Wake Shield Facility yields ultra-pure samples

Preliminary results from the Wake Shield Facility, flown as part of the STS-69 mission in September, have shown that the free-flyer created a vacuum 1,000 times better than what can be produced on Earth.

Alex Ignatiev, director of University of Houston's Space Vacuum Epitaxy Center that developed the WSF, reports that the vacuum of space produces higher purity materials.

"The four samples grown were the best in elemental purity," Ignatiev said. "These results confirm the ultra-vacuum of space is a unique environment for fabrication of high purity semiconductor materials and helps build the foundation for the future use of space for producing thin film material."

The Wake Shield Facility is a 12-foot-diameter stainless steel disk designed to generate an "ultra-vacuum" environment in space to grow thin films for next generation advanced electronics.

The STS-69 crew deployed the WSF-2 on day five of its mission for a 50-hour free flight from *Endeavour* to achieve and characterize for the first time an uncontaminated "ultra-vacuum" in low-Earth orbit; and demonstrate the feasibility of epitaxial growth of high quality compound semiconductor thin films.

"It worked," Ignatiev said. "We were able to demonstrate, not conclusively, that we can produce higher purity materials in space. We had some problems on the flight

but overcame these problems with the help of ground support in Mission Control and the STS-69 astronauts."

While WSF-2 experienced some problems, preliminary findings of the four samples grown, two samples achieved the highest purity greater than any chamber growth on Earth.

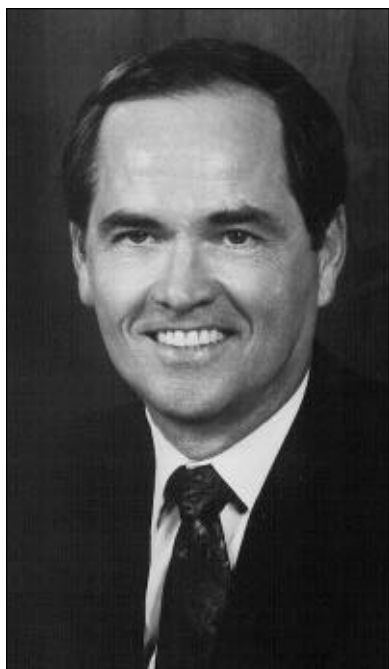
"We had an interesting and eventful flight and we are looking forward to our next flight on STS-80 in November 1996," Ignatiev said. "We will use the STS-69 data to enhance the science and technology of the next flight."

The commercial applications for high-quality semiconductor devices are most critical in the areas of cellular telephones, high-

speed transistors and processors, high-definition television, fiber optic communications and opto-electronics. The majority of electronic components used today are made of the semiconductor silicon, but there are many other materials that could achieve higher predicted performance than silicon. Atomic quality, sample size and sample processing all suffer for compound semiconductors, and improving these parameters would result in high quality semiconductor materials which could lead to a new generation of electronic components.

The space ultra-vacuum concept was first identified by NASA more than 20 years ago. Epitaxy, the growth of atomically ordered

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Robert Crippen

Crippen to be honored in Houston

Former Kennedy Space Center Director Robert Crippen will receive this year's National Space Trophy, bestowed by the Rotary National Award for Space Achievement Foundation.

Crippen will receive the award during a banquet in his honor Feb. 15 at the Houston Hyatt Regency. Crippen is the tenth recipient the award, which recognized outstanding contributions to space exploration. The featured speaker at the awards banquet will be U.S. House of Representatives Science Committee Chairman Robert Walker, R-Pa.

NASA Associate Administrator for Space Flight J. Wayne Little cited Crippen, "for his distinguished service in advancing the U. S. space program, his pivotal role in the space shuttle return-to-flight effort and his leadership of both the space shuttle

program and the Kennedy Space Center."

In nominating Crippen for the award Little said, "Mr. Crippen has demonstrated the rare ability to construct a vision of the future and translate it into action today. Moreover, his broad experience, technical expertise, management skills and dedication to a strong U. S. space program have worked to make his contribution to space exploration a profound and lasting one."

Crippen served as KSC director for three years. During his tenure, the center processed and successfully launched 22 shuttle missions and 42 expendable rocket flights. He provided leadership and contract oversight for over 13,000 civil service and contractor personnel. While ensuring the highest safety standards in an extremely hazardous environment he

implemented cost savings of greater than 25 percent by establishing and developing new quality management techniques and reducing shuttle and payload processing times. Overall, his management saved the government over \$130 million.

Crippen became an astronaut in September 1969. He was a member of the astronaut support crew for the Skylab 2, 3 and 4 missions and for the Apollo-Soyuz Test Project mission. He was the pilot on STS-1 in 1981 and commander of STS-7 in 1983 that included the first woman astronaut, Sally Ride. He also commanded STS-41C in April 1984 and his last shuttle flight was STS-41G in October 1984.

For information on the foundation or to purchase tickets to attend the banquet contact Charles Hartman at 480-6167.

